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CMP-CB-75-16

Current Background

American Consulate General
Hong Kong

No. 1038
November 28, 1975

This edition is printed in the United States of America for dissemination in the Western Hemisphere, Europe, the Mediterranean, and the west coast of Africa from material produced by the American Consulate General, Hong Kong. All queries concerning this edition should be sent to:

National Technical Information
Service (152.12)
U.S. Department of Commerce
Springfield, Virginia 22151

"Eight-Point Charter" for Agriculture

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On China's "Eight-Point Charter" for Agriculture

-- First of a Series

(NCNA-English Peking, Nov. 8, 1975)

chairman mao formulated in 1958 an "eight-point charter" for agriculture, which scientifically summed up the chinese peasants' long years of rich farming experience, including their experience in carrying out the technical transformation of agriculture since liberation. the charter has played an important role in increasing farm production over the past 17 years. guided by it, the rural people's communes and agricultural scientific research institutes have made new progress and gained new experience.

the eight points are as follows:

one, soil. this refers to deep-ploughing, land levelling and soil improvement so as to raise soil fertility. it includes rational planning and utilization of land, conservation of water and soil and the opening up of new farmland wherever conditions allow.

two, fertilizer. this means the tapping of all possible fertilizer resources and the rational application of fertilizer. china takes organic manure as the chief source of fertilizer, and at the same time encourages the production of chemical fertilizer. while using the land, the chinese communes replenish and raise its fertility to promote farm production.

three, water conservancy. this means harnessing rivers and building irrigation and drainage projects. it includes the rational storage and use of water so as to increase the capacity to resist floods and drought.

four, seed. this means selecting, breeding and propagating good crop strains and purifying and rejuvenating fine varieties of seed.

five, close planting. this stands for rational close planting to achieve the optimum number of effective plants per unit of farmland, making fuller use of land fertility, sunshine and air, raising the multiple cropping index by changing from one to two or three crops a year so as to raise the land utilization rate.

six, plant protection. this requires a good job to be done on plant protection so as to prevent or control plant diseases and harmful insects and ensure the normal growth of the crops.

seven, field management. this demands good field management based on the laws governing plant growth.

eight, improvement of farm tools. this means improving farm implements while supplying china's agriculture with modern equipment suited to the country's specific conditions, and step by step bringing about the mechanization of agriculture.

though each of the eight points in this charter has its special role in increasing farm production, they are correlated and mutually condition and promote each other. as to the internal relationship between these eight points, soil, fertilizer and water constitute the basic factors indispensable for crop growth. therefore, in order to achieve good harvests, it is necessary, first and foremost, to concentrate on them. but even if these basic factors are present, it is impossible to achieve high yields without fine varieties of seed. it is necessary not only to have good strains of seed, but to carry out rational close-planting, strengthen field management and prevent, or keep under control, harmful insects and plant diseases. all this helps bring into play the good properties of the crop, enable it to make full use of the positive conditions provided by man, develop the favourable conditions in the plants during their growth and maturing period, and overcome the various unfavourable conditions readily, effectively and in good time. when machines replace heavy manual labour and labour efficiency is raised, the "eight-point charter" will come to all-round implementation, creating conditions for the continual increase of farm yield and for speeding up the modernization of agriculture.

in an interview with hsinhua, an official of the ministry of agriculture and forestry said that the "eight-point charter" defines the laws of agricultural production and lays down the cardinal principles for scientific farming in china.

he added: "in the past quarter of a century, china has put an end to its traditional grain deficiency. it has achieved sufficiency in grain and even has a surplus. ever since china overcame the three years of natural adversities from 1959 to 1961, it has had good harvests for 14 consecutive years. over 700 counties and cities have come to the fore with per unit grain yields surpassing the targets set in the national programme for agricultural development, which stipulates an average of three, three point seven five and six tons per hectare for different parts of china respectively. in short, while the high-yielding areas have made further advances, the low-yielding areas have become high-yielding. this is the result of the rural people's communes' carrying through chairman mao's proletarian revolutionary line and implementing the 'eight-point charter'."

a salient feature in carrying out the "eight-point charter" in china is that the study and application of science and scientific experiments are not limited to a few scientists and technicians; the broad masses of peasants participate. agricultural scientific research institutes have been set up at the central, provincial and regional levels. nearly all the prefectures and most of the counties have such institutes, too. many scientists are engaged in special research there, and often work with members of mass scientific and experimental groups in the people's communes, production brigades and teams. the total number of people taking part in such activities in china's countryside is well over ten million. among them are basic-level rural cadres and experienced peasants bold in making innovations, trained agro-technicians and educated young people. they form the backbone force for carrying out scientific farming in the light of the "eight-point charter", which has become a mass movement in china.

the noted peasant wheat expert liu ying-hsiang, a former poor peasant in central china's honan province, explained why the masses are eager to adopt the measures stipulated in the charter. "in the old society," he said, "most of the land was in the hands of the landlords and rich peasants. the poor and lower middle peasants, farming on small rented plots, were brutally oppressed and exploited. how could they afford scientific farming?

"following liberation, land reform was carried out, and the poor and lower-middle peasants became masters of the land. they embarked on the road of socialist collectivization and set up the people's communes, which has enabled them to undertake farmland improvement projects in a planned way and on a large scale. the communes provide funds, experimental plots and fertilizer for scientific research. all this has made it possible for the peasants to engage in scientific experiments and research."

Land Improvement in China -- Second of a Series
on China's Agricultural "Eight-Point Charter"

(NCNA-English Peking, Nov. 10, 1975)

china's 100 million hectares of cultivated acreage constitutes only a little over ten per cent of the country's total area. much of the land under cultivation was formerly poor, low or non-yielding land of various types. yet the chinese peasants have managed to constantly increase grain output and grow enough to feed a population of 800 million. large-scale farmland improvement work is an important factor in this achievement.

china has since liberation turned 33 million hectares of farmland into fields that give stable yield despite drought or excessive rain. china reaped a good harvest this year, the fourteenth consecutive good harvest year, despite drought and floods.

a nation-wide survey made in 1958 classified more than one-third of the land under cultivation as red earth, alkali and sandy land, cold water-soaked land and land susceptible to drought and waterlogging. hard work over the past quarter century has enabled the peasants to improve more than half of the alkali land in northern china, and reclaim and improve eight million hectares of red earth in ten provinces and one region in the middle and lower reaches of the yangtze river.

one-fifth of the erosion-impoverished land in china has been improved and more than two-thirds of the land susceptible to waterlogging has been protected by drainage facilities. poor sloping fields and cold water-soaked land have been improved in mountainous areas. forest belts totalling several thousand kilometres and extensive water conservancy projects have brought about an increased number of green oases in the desert areas of northwest and north china.

in this struggle to improve the land, the tachai production brigade in north china has set an example for other brigades to follow. the brigade, situated in hsiyang county, shansi province, in the taihang mountain area over 1,000 metres above sea level, had 53 hectares of fields which were scattered over gullies and hill slopes and were covered by a thin layer of poor topsoil. relying on their collective strength and through hard struggle, the local peasants have transformed the eroded sloping land into fields that conserve water, soil and fertilizer. between 1970 and 1974, the peasants removed 33 hillocks by blasting and filled in 15 gullies to merge the 5,000 scattered plots into 1,500 tracts of contour terraced fields. more than half of the brigade's land is now suitable for mechanized farming. by means of deep

ploughing, applying more organic fertilizer, adding a thick layer of good topsoil and improving irrigation, the tachai peasants have turned the poor soil into fertile soft "spongy" fields. as a result, they have been able to increase grain output from 0.75 to 7.5 tons per hectare.

two important methods china has adopted to improve soil are deep ploughing and land levelling. as early as 1958, a production brigade in changko county, honan province, considerably increased its grain output by deep ploughing. chairman mao recommended the experience of this brigade to the whole country. since then, china has launched mass movements every year to deep-plough and level fields. in the case of low-yield rock-strewn fields with a thin layer of poor soil, the peasants dig deep or blast the fields to remove the rock from underneath the topsoil, after which they bring in fertile soil to raise topsoil quality and build protective embankments. they also mix sand with clayey soil or clay with sandy soil to improve them.

proceeding from the aim of building a socialist, modernized agriculture, many counties and communes on the north china and northeast plains, the yangtze and pearl river deltas and other plains are working hard to merge their fields into large tracts of garden-like farmland to pave the way for total mechanization.

soil improvement involves the movement of large quantities of earth. but the chinese peasants, filled with high socialist enthusiasm, do not shrink from this hard work. the exploits of the hsiaotantzu production brigade in tingpien county of shensi province are an example.

to improve the brigade's sandy soil the peasants carried in clay from an old river course several kilometres from their village. some of the villagers worked out that to improve one hectare of land alone required 2,100 cartloads of clay. if the distances covered by the carts were added up, they would come to 12,750 kilometres. since the brigade had 186 hectares of fields, the task would be virtually impossible, they said. but the poor and lower-middle peasants were undaunted. "ten thousand kilometres is nothing if we can make our sandy fields produce more for the revolution," they declared. in three years, they brought in 123,000 cartloads to improve 57 hectares of soil.

the chinese peasants have deep-ploughed millions of hectares of land every year in the deepening movement to learn from tachai during the cultural revolution. some fields have been deep-ploughed twice. working in such a revolutionary spirit and taking various scientific measures, they have made the land more fertile and raised the yields year after year. this convincingly refutes the "law of diminishing returns" preached by some western pundits and their absurd predictions about the bleak prospects of chinese agriculture.

in the ten provinces and one region along the yangtze and south of the yangtze, including hunan, kiangsi and kwangtung provinces and the kwangsi chuang autonomous region, over 40 per cent of the farmland consists of red earth, including ten million hectares of rice paddy. the red earth lacks organic matter, has a high acid, low nitrogenous and phosphorous content and does not adequately hold moisture and fertilizer. in the large-scale soil-improvement campaign over the past decade, the peasants have planted more trees on slopes to check erosion, terraced sloping fields, brought in fertile topsoil, grown green manure, applied phosphorous fertilizer and engaged in intensive and meticulous farming to increase the fertility of the soil.

a good part of the red earth area has been turned into fields giving stable, high yields despite drought or excessive rain. output increases range from 20 to 30 per cent. more than 100 counties in the red earth area have averaged six tons of grain per hectare, some averaging more than 7.5 tons. on the formerly barren red earth slopes in the area, the peasants have built tea plantations, fruit orchards and planted groves of tea oil and tung oil trees, pines and firs.

long years of neglect by the reactionary ruling classes of the past had made much of the country vulnerable to inundation and left large tracts of low-yield and barren alkali land. these included the plains along the yellow river valley and valleys of the huaiho and haiho rivers, the pohai coast and areas in inner mongolia, ningsia and sinkiang. in fact, soil alkalinity and salinity was one of the main causes of the serious grain shortages in hopei, shantung and honan provinces and northern parts of kiangsu and anhwei, which necessitated the transport of grain from southern to northern china.

the commune peasants in this area have worked out a number of methods to transform alkali wasteland with the result that some of the area's communes and brigades have been able to average 7.5 tons of grain output per hectare. among the popular methods used are digging ditches to wash out the alkali salts by irrigation and drainage and building raised fields.

in tsangchou and hengshui prefectures, hopei province, where nearly all the land under cultivation is alkaline, the peasants sink wells and pump out underground water to lower the water table, then irrigating the fields with fresh water stored in ponds. this proved so effective that in 1974, a score of counties in the two prefectures doubled the grain output figure for 1963, the year before the method was introduced.

in alkali soil areas in honan and shantung provinces, silt-laden water from the yellow river is siphoned off

to flood the low-lying alkali fields, covering them with a layer of fertile silt suitable for growing paddy rice.

thanks to the recent years of effort by the research institutes, china has made progress in the use and production of chemical and other soil improving agents.

in the farmland improvement program, the peasants of new china have also reclaimed land from barren slopes, mountain valleys, dry river beds and along the sea coasts and made the land produce good crops.

the people in huihsien county of honan province harnessed the rivers by means of strong dykes and turned the wide banks into fertile fields. they have straightened winding river courses and diverted river water to new courses to make room for more farmland. they have constructed reservoirs on the upper reaches of the rivers, built tiers of embankments below, then filled in the dried river beds and turned them into productive fields. they have built culverts beneath gullies and made farmland on top of the culverts. in these and many other ways they have in recent years added 13,000 hectares, expanding the acreage under cultivation in their county by one-third.

Chinese Peasants Stress Rational Application of Fertilizer -- Third of a Series on China's Agricultural "Eight-Point Charter"

(NCNA-English Peking, Nov. 10, 1975)

traditionally called "the food for food grain" by chinese peasants, fertilizer figures prominently in china's "eight-point charter" for agriculture.

outstanding in china's approach to the fertilizer question is the emphasis it places on organic manure as the principal source of plant nutrients, with chemical fertilizer in a supplementary role.

using inorganic chemical fertilizer along does not prevent the depletion of the organic matter in the soil and often results in lumpy soil. farm manure, on the other hand, helps increase the organic matter which improves the soil structure. by using both types of fertilizer, chinese peasants have been able to wrest more and more grain from the land and at the same time increase soil fertility.

the farm manure used in china includes human and animal excrement, compost, pond and river sludge, plant ashes

and green manure, the supply of which is virtually inexhaustible. bringing these otherwise waste materials into use requires manpower alone, and little or no cash investment. by their diligence and ingenuity, china's working people make it possible for the rural communes to solve the fertilizer problem by their own efforts.

take the nationally famous tachai production brigade of north china for example. though supplies of chemical fertilizer have increased in the past few years, the brigade mainly uses farm manure. applied every year per hectare are more than 100 tons of plant stalks mixed and fermented with dung and urine and a small amount of phosphorus fertilizer. this is eleven times the amount used in the pre-liberation period.

at the same time, by terracing hill slopes, deep ploughing and other measures, tachai has transformed its unproductive loess land into fertile "sponge fields" -- so-called because the soil is porous in structure, well-aerated and well-moistened. the top layer of mature soil has been increased in depth from some 10 cm. at the time of liberation to more than 33 cm. at present, thus providing favourable conditions for maintaining fertility and for plant growth.

soil tests show that the organic matter in the "sponge field" soil has increased from 0.4 percent to two percent in the same period, while the amount of nitrogen has more than doubled. tachai's grain yield has exceeded 7.5 tons per hectare, a ten-fold increase over that of the pre-liberation years.

this is ample proof that the chinese peasants, relying on the strength of their socialist collective economy, are able to increase soil fertility continuously through the improvement of farmland and the rational application of fertilizer -- a sharp contrast with the situation in old china, when the land became more and more impoverished.

most widely used of all in china is pig manure. one pig produces about three tons of dung and urine a year. fermented with earth and grass, this amounts to five to ten tons of fine manure. with the addition of a certain amount of chemical fertilizer this is enough to ensure a high yield on one mou (one-fifteenth of a hectare) of farmland. that is why chinese peasants have set themselves the target of raising "one pig per person" or "one pig per mou". many prefectures, counties and communes have reached this target. the total number of pigs in china has gone up more than four-fold since liberation.

while pond and river sludge is an important source of fertilizer in the yangtze, pearl river delta and similar areas, green manure is being used on a rapidly increasing scale throughout china. the total acreage

sown to green manure crops has expanded from about 1.33 million hectares in the early post-liberation period to the present 6.6 million hectares. these include milk vetch and sesbania in the south and alfalfa and hairy vetch in the north.

competition for space between these and over-wintering food crops has intensified as more and more areas in the south switch from double to treble cropping -- two crops of rice plus one crop of winter wheat or legumes. to solve the problem, chinese commune members have turned more and more to using water plants, such as green duckweed, as green manure. green duckweed is easily grown in ponds, small rivers or paddy fields and can be reaped once a week or at even shorter intervals. an increasing number of places now also produce bacterial fertilizer and use peat to make humic acid fertilizer.

though priority is given to organic manure, china is energetically developing its chemical fertilizer industry, following the policy of building big, medium-sized and small plants simultaneously. the stress is on the latter two categories.

smaller plants have many advantages. they need less investment than the big ones and can be built quickly. this puts them within the reach of many prefectures and counties. in addition, such plants are usually located in the countryside, thus saving transport costs.

the more than 1,000 small chemical fertilizer plants now in operation in china's over 2,000 counties use locally available coal, phosphate and other resources as raw material, and account for about half the national nitrogenous fertilizer output.

to get maximum effect, chinese commune members have improved their methods of applying fertilizer. they use different kinds of fertilizer for different kinds of soil and terrains and according to the different needs of crops at various stages of growth. for example, stable manure, which releases more heat in the course of fermentation, is most frequently used on fields that get a lot of shade. pig manure, which releases less heat, is more often applied to fields that get direct sun.

in many places, fertilizer is applied to layer on layer of soil so that the roots can get nourishment as they go deeper and deeper. another method, called deep application of granulated manure, prevents loss of fertilizer, especially in the warm areas. kwangtung province in south china has used this method on more than 66,000 hectares of land, achieving an average output increase of about 15 percent.

rational application of fertilizer has enabled intensive farming and high-yield areas in china to raise soil fertility.

soochow prefecture in the yangtze delta is one of china's most densely populated areas where intensive farming is an age-old tradition. it has a population of 5.8 million, but only 446,000 hectares of farmland. in the past two decades and more, it has changed from single or double cropping to three crops a year on most of its grain-producing land. local commune members use 60 tons of organic manure per hectare for each cropping, making a total of 180 tons per hectare a year. therefore, the proportion of organic matter in the soil has generally increased from two to 2.5 percent.

thanks to all this, soochow prefecture was able to reap 10.14 tons of grain per hectare last year. total grain output has gone up three-fold in the past 20 years or so, while its rural population has increased less than 50 percent.

for the peasants in soochow prefecture, who were constantly haunted by hunger in old china, annual grain consumption has increased to 275 kilogrammes per head. after setting aside enough grain for food, seed and fodder, the prefecture last year sold 1.25 million tons of grain to the state, an amount that exceeds its total grain output at the time of liberation.

China Taps Her Water Resources for People's Benefit -- Fourth of a Series on China's Agricultural "Eight-Point Charter"

(NCNA-English Peking, Nov. 11, 1975)

new china has brought to an end centuries of catastrophic famine caused by drought and flood. in old china, natural disasters often resulted in widespread crop failures and hunger. the subsequent exodus of peasants who either fled the famine or died of starvation brought further agricultural decline in a vicious cycle that marked the ages.

the founding of new china marked the beginning of a new era in which the masses were mobilized to control her waters. the country's rich water resources are now being utilized for the good of the people.

in the 2,000 years before china's liberation, there occurred 1,029 big floods and 1,056 grave droughts.

a disastrous drought in 1920 brought tragedy to 20 million people in five provinces of northern china and caused 500,000 deaths. in 1931, when china was under the rule of the kuomintang reactionaries, the yangtze and huai rivers overflowed their banks, affecting the lives of 100 million people and causing 260,000 deaths.

chairman mao has pointed out: "irrigation is the lifeblood of agriculture". as soon as new china was founded and the people became their own masters, they started to deal with the problem of water control which the chinese people had wanted and needed to solve for centuries. they tackled the work by collective strength with state support. for the past two decades, in every winter and spring, tens of millions of people have worked on building farmland water conservancy projects. in the past four years, some 100 million people have participated in the work every year. in mountainous areas and plains susceptible to drought, large tracts of fields are now protected by irrigation. in many of china's important agricultural provinces, autonomous regions and city environs, half of the land under cultivation or even more is provided with irrigation facilities. over two-thirds of china's 23.3 million hectares of low-lying fields are provided with drainage systems. the unruly rivers are being harnessed stage by stage. in areas hit by frequent drought and waterlogging in the past, fields have been improved to give stable yields despite drought or excessive rain.

thanks to the water conservancy works, china's agriculture is now more capable of resisting rainstorm and drought. good harvests have been reaped for 14 years running despite local droughts and floods that in pre-liberation china would have wrought havoc and disaster.

big dykes totalling 130,000 kilometres now line both banks of the bigger chinese rivers. on these rivers and their tributaries are sited 2,000 big and medium reservoirs. on the middle and lower reaches of these rivers 100 river channels have been dredged or newly dug, including channels capable of discharging several hundred to several thousand cubic metres of water per second.

at the same time, small water conservancy projects counted by the million have been completed. the total amount of work put into these small projects far exceeds that of the big and medium-sized projects. scattered in all parts of the country, these small projects require modest investment, can be built quickly and make effective use of the water resources that spread far and wide across the vast countryside. they and the big and medium projects are planned to complement each other.

in mountainous areas, which constitute two-thirds of china's total area, and particularly in southern china's hilly areas where streams are abundant, local peasants have built millions of ponds and reservoirs, and dug channels winding around the mountains to lead water into the fields. in some areas, such reservoirs and mountain-girdling channels are designed to make up a systematic irrigation network. in many places, the peasants have built water turbine or other pumping stations at the foot of the mountains to hoist water uphill to irrigate fields on slopes.

in china's northern latitudes where the rivers often dry up to the bottom, the peasants dig wells to tap the abundant underground water for irrigation. before liberation, there were only shallow, windlass wells and mule-drawn waterwheels. these wells dried up quickly in times of drought. today, there are 1.5 million mechanized wells from 10 to 300 metres deep which in the past several years have played an important role in combating drought in north china.

in the campaign to level the fields, the peasants on the plains have at the same time dug irrigation and drainage ditches around squared fields in a chessboard pattern. on the yangtze and pearl river deltas and in the tungting lake area, the communes and brigades have built with state help networks of power-driven irrigation and drainage stations, each capable of serving several hundred thousand hectares.

in areas on the fringes of the deserts in sinkiang, local people have dug irrigation channels, led in melted snow from the mountain slopes and built large oases.

in solving the problems involved in water conservancy work, a number of localities have set outstanding examples by working hard and relying on their own efforts.

one of them is linhsien county in central china's honan province. the area is so arid that people in 300 of the 500 villages in the county used to fetch water by bucket from several kilometres away. the county party committee determinedly led the people in cutting a network of canals through the taihang mountains to lead in water from the changho river in neighbouring shansi province.

the commune peasants discussed the project, and arrived at this consensus: "aridity has plagued our county year after year. we have only two alternatives: either transform the county's environment so we can contribute our share to socialism, or retreat from the hard struggle, leave ourselves at the mercy of nature and remain impoverished." they pledged to work hard to become the masters of nature and not its slaves.

in ten years of hard work from 1960 to 1969, the people in linhsien county cut 180 tunnels, built 152 aqueducts, dug a 70-kilometre-long trunk canal and auxiliary channels totalling 1,500 kilometres across 1,200 rock-strewn hills and hanging cliffs. in the past few years, they have built 300 medium-sized and small reservoirs linked up with the trunk canal and its ramification which now irrigate more than half of the county's 60,000 hectares of cultivated land.

in neighbouring huihsien county where aridity is just as bad, the people have in the past eight years built several thousand small and medium-sized water conservancy projects to tap the area's scattered water resources. they have constructed 33 small and medium-sized reservoirs to store rain and river water and tapped subterranean water under dried river beds. in one instance, they increased the flow of a fountainhead from 0.2 cubic metres to 1.5 cubic metres per second and led in the spring water to irrigate 2,000 hectares.

in this way the people of huihsien county have provided 70 per cent of the fields with irrigation facilities.

in the tu-an yao autonomous county in kwangsi, the local people have solved the problem of irrigation despite difficulties caused by the karst topography. they cut tunnels totalling 40 kilometres through rocky mountains to lead in river water for irrigation and drain off flooded water in low valleys hemmed in by mountains. furthermore, they installed 180 stations to pump underground water for irrigation from the numerous limestone caves.

to conquer these water conservancy problems, china has brought into full play the initiative and collective wisdom of the masses. the guiding principle is the integration of big, medium and small projects with the emphasis on small ones. the state encourages the communes and brigades to build water conservancy projects on their own, while providing them with some help where necessary. since china is a developing country, this principle has enabled the state to concentrate manpower, material and funds on the big and medium undertakings, while mainly relying on the people's communes and production brigades to tackle the small projects which are within their capacity. this also brings the people's initiative into fuller play and makes it possible to build more projects at a faster pace. as the collective economy grows in strength, many people's communes working on their own or in cooperation, with the state's help, are now able to harness small rivers and build reservoirs with a storage capacity up to a million cubic metres.

many counties, communes and brigades now make the tools, lime, cement and explosives needed for water conservancy work by themselves. the state supplies the localities with steel, machines and cement if required. but, by and large, most people still use shovels, hammers and chisels, explosives and pushcarts in the work of carving channels out of the mountains, building reservoirs and digging canals.

"we are building water conservancy projects for socialism, for ourselves as well as for posterity." this is the way chou pao-shan, a poor peasant in the old society, puts it. he voices what is in the minds of the people as they work on water conservancy projects in all parts of the country.

Seed Breeding in New China -- Fifth of a Series on China's Agricultural "Eight-Point Charter"

(NCNA-English Peking, Nov. 11, 1975)

in new china, seed breeding, selection and research is a joint undertaking by millions of commune members, rural cadres and scientists, not the exclusive business of a few experts.

the seeds used traditionally in old china offered little prospect for raising crop yields because of adulteration of strains and other weaknesses. since liberation, chinese peasants and scientists have developed large numbers of new and improved varieties that give high yields, ripen early and are resistant to natural adversities.

these high quality varieties are well adapted to the improved conditions in soil, fertilizer and irrigation and to close planting and other new farming techniques. there have been at least three large-scale replacements of rice, wheat, maize and cotton seeds since liberation. peasants call this "seed renewal".

seed improvement is one of the basic items in china's agricultural "eight-point charter" since fertilizer, irrigation, close planting, field management and other factors become operative only through the seed itself. seed improvement is the most effective and economical way of increasing agricultural yields.

eighty per cent of china's cropland under rice, wheat and cotton is sown to improved varieties. hybrids of

maize and kaoliang account for more than half the acreage under these two crops. potato hybrids are also being widely used.

rice is china's main grain crop. shortly after liberation, high-yield replaced low-yield varieties in the country's main rice-producing regions south of the yangtze. but these were long-stalked and not resistant to lodging. in 1958, two peasants in kwangtung province developed china's first dwarf variety of rice. and early in the 1960's high-yield dwarf varieties of rice were introduced in the greater part of the rice-producing regions.

in recent years, new dwarf rice varieties that give higher yields, require a shorter period of growth and are more resistant to natural adversities have been developed to help raise the multiple cropping index, that is, increase the number of crops grown on the same land in the year.

high-yield, rust-resistant wheat varieties have been popularized in the wheat-producing regions in the north. the country's leading wheat producer, honan province, which has four million hectares of wheatfields, has registered steady increases in wheat output thanks to four large-scale replacements of seeds.

peasants, scientists and agro-technicians in china have worked together to apply mono-and poly-ploid breeding, radiation and other advanced techniques in developing new crop varieties. dozens of high-yield varieties of rice, wheat, cotton and other crops have been developed in recent years with the aid of radiation and other techniques. a hybrid of wheat and rye, the octoploid triticale, is being popularized in mountainous regions with good results.

in many parts of china, the breeding and verifying period of a new variety has been reduced to four or five years as against eight or nine years in the past. agricultural research institutions and communes send people to the appropriate climates, the warmer south or the colder north, to test promising new varieties. seeds that are to be verified are trial-grown by communes and their sub-divisions in different areas simultaneously so that a wealth of data can be collected within a short period, cutting the time necessary for verifying a new variety. the kwangsi chuang autonomous region in south china has made comparative studies of more than 100 rice varieties at 127 centres.

in china, the policy is to encourage all areas to select and propagate on their own high-quality seeds suited to local conditions and store them for their own use. this helps accelerate the propagation of fine varieties and maintain their purity.

but the policy allows for limited amounts of seed to be brought in from other areas when necessary. in such cases, the government gives the shipments priority. ambary hemp. which gives high yields in north china, does not produce seeds there because of the cold weather. the government transported thousands of tons of ambary seeds from sub-tropical kwangtung and kwangsi to the north every year.

in addition to central, provincial and prefectural agricultural research institutions, almost every county in china's major agricultural areas has seed farms and most communes and their sub-divisions have seed breeding plots and plots for testing different varieties of seed.

in many communes and their sub-divisions dozens of different varieties, including those being acclimatized, are often grown side by side in a single plot for comparative studies by groups made up of experienced peasants, cadres and agro-technicians. these comparative studies are used as a basis for the selection, propagation, purification and regeneration of fine varieties as well as for hybridization.

the comparative studies also make possible the optimum use of farming conditions and the labour force. by planting varieties that ripen at varying dates, harvesting is not concentrated in too short a period and the burden on the peasants lightened.

the agricultural research institutions at all levels and the rural experiment groups work in close cooperation through constant exchange of seeds and related information. the experiment groups help the research institutions study the properties of certain new varieties that are to be verified, and report to the institutions the results of their study in their own areas.

teng yen-tang, 41, who heads the peasants' seed breeding research station in hsinhui county, kwangtung province, remarked: "seed breeding is very important and constant advance is essential. it takes many years to develop a new variety. we have to consider the production needs and farming conditions many years ahead. we are doing our best to develop new rice varieties that will give higher yields, ripen earlier and be more disease-resistant than present ones."

teng yen-tang has more than a dozen improved varieties of rice to his credit. he added: "before liberation never got enough to eat. liberation made it possible for us peasants to do scientific research and go into seed breeding. is it any wonder we take the interests of sociatism to heart."

Rational Close Planting Boosts Agricultural Production -- Sixth of a Series on China's Agricultural "Eight-Point Charter"

(NCNA-English Peking, Nov. 12, 1975)

rational close planting, which ensures full use of land fertility and sunlight to achieve high per-unit yields, is one of the measures that has been widely adopted by people's communes all over china in the drive to increase agricultural production.

the idea of close planting covers a rational arrangement for the density in sowing crops, interplanting of crops and growing of two, three or even more crops on the same plot in a year.

generally speaking, the density in planting reflects in a nutshell the standards achieved in soil improvement, fertilizer application, drainage and irrigation, seed, and field management. close planting has been made possible by the continual progress in all these aspects since liberation. in many parts of china, the density in planting has been raised by anywhere from under 100 per cent to several times.

before liberation, chinese rice growers spaced out rice seedlings 8 inches to a foot apart each way. now the spacing is 4 to 6 inches in general, with the minimum spacing at 3 to 5 inches. this means that where before liberation 90,000 to 150,000 clusters of rice seedlings were planted to a hectare now 300,000 to 600,000 clusters are set out.

close planting has brought about a density of effective ears never reached in the old days. in south china, those rice fields yielding an average of 7.5 tons per hectare from one crop generally have 4.5 million to 6 million effective ears to the hectare. six million to 7.5 million effective ears are counted on each hectare in wheat fields in the north with a per-hectare yield of 6 to 7.5 tons.

however, close planting does not mean the greater the density the better. the density in planting depends on specific conditions in different localities.

close planting also refers to interplanting of two or more crops. a common sight on interplanted land is that when one crop is about to be harvested another is sprouting between the rows. fields under this kind of cultivation are farmed through all seasons of the year.

to get two crops a year in north china, planting maize or cotton between rows of unharvested wheat is the common pattern. in some places, after the wheat interplanted with cotton has been harvested, late maize is grown in the vacated rows as a third crop in the year.

but interplanting differs widely in different areas. hohengcheng brigade in the north china plains, renowned for scientific farming, has worked out 20 different interplanting patterns. commune members there say: "by using every plot of land as if it were two or three times its size, we can contribute more to socialist construction."

in the south where the frost-free period is longer, the interplanting patterns are even more diversified.

in both north and south, tall-stalked crops are usually interplanted with short-stalked plants in combinations such as maize -- soybean, sugarcane -- soybean or tobacco -- potato. besides, crops having tap roots (such as cotton) and those having fibrous roots (such as wheat) are often interplanted. the peasants also interplant early-ripening crops like vegetables with late-ripening crops like cereals in order to stagger the absorption of plant nutrients over the different growing periods in order to fully benefit from the application of fertilizers. interplanting brings other benefits as well. the interplanting of soybean, pea or groundnut with other crops increases the nitrogen-fixing bacteria in the soil. the ladybird beetle which frequents wheat crops helps control the cotton aphis in fields where wheat is interplanted with cotton.

the acreage on which crops are planted in sequence has been increased over the past few years. in the south where two crops of rice are grown, the sequence pattern is now widely used in place of the conventional ways of interplanting and has raised the yield of each crop.

owing to the change in cultivation practice, the system of one crop a year, or three crops in two years, common in the north has been discarded in favour of two crops a year over large areas. more and more areas in the south have switched from the one or two crops a year formerly practised to two or three crops a year. fields under three crops a year in the south are generally planted with two rice crops and one over-wintering crop like wheat, bean, rape, potato or green manure, or alternatively with one rice and two dry crops. in china's southernmost province of kwangtung, some places are experimenting with growing four crops a year -- three rice and one wheat or two rice, one potato and one wheat.

the patterns of close planting have been selected after being tested through mass scientific experimentation. in china's major agricultural areas, many people's communes and their sub-divisions keep plots reserved for comparative experiments in close planting. in liuchuang brigade of the chiliying people's commune in honan province, which is one of china's oldest people's communes, experiments in close planting of cotton progressed steadily from 15,000 plants per hectare right up to 150,000. experiments are also extensively conducted in various places to determine the interplanting patterns best suited to local conditions.

in determining the density in planting, people's communes and brigades take into consideration the whole process of growth from the seedling to the ear and ripe grain. arrangements are made in accordance with the natural and farming conditions and labour force available in different localities. discussions by local cadres and commune members precede any decision on the density in planting. the fixing of the density gives thought to field management and the principle of reducing production costs and raising total output.

peasants throughout the country are exploring new close planting patterns through experiments. peasants in north china have succeeded in achieving good harvests of both cotton and wheat by raising ridges in the fields to grow cotton while planting wheat in the furrows in between so as to improve air and sunlight conditions.

peasants in some parts of kwangtung province improved air and sunlight conditions in rice fields by spacing out the seedlings 2.5 inches apart in rows 8 inches apart instead of the former pattern of 4 inches by 5, without altering the total number of plants per hectare. this measure alone resulted in a 10 per cent increase in rice yields.

what is the maximum density in close planting and the maximum number of crops that can be grown in a year? the people's knowledge of these questions is changing in step with the progress made in scientific farming.

model peasant li kwangching achieved a record yield of 7,823.5 kilogrammes on an experimental plot one-third of a hectare in size planted to wheat -- rice -- rice. "things develop without cease," he remarked, "and the knowledge of the people develops accordingly. there are no limits in production. the potential of the land is still a long way from being fully tapped."

Plant Protection in New China -- Seventh of
a Series on China's Agricultural
"Eight-Point Charter"

(NCNA-English Peking, Nov. 12, 1975)

three and a half million peasants are manning a network of stations that serve as scouting posts as well as forecasting and research centres in the nation-wide battle against insect pests and plant diseases in china's countryside. these stations are in fact the very nerve-centre of the battle.

in close coordination with scientific research institutions, these rural scientific workers make a systematic study of the habits, migrations and life-cycle of crop-damaging insects and the incidence of plant diseases. on the basis of these observations, they work out the most effective and economical control measures.

Little or nothing was done about plant protection and practically no research work was carried out in this respect in pre-liberation china, a semi-feudal, semi-colonial country where insect pests and plant diseases wreaked havoc on the crops.

now plant protection is recognized as one of the most important items of the "eight-point charter" formulated by chairman mao tsetung for guiding agricultural production. the principle guiding plant protection work in china is to use measures of various kinds for both prevention and control with the main emphasis on prevention.

over the 20 years and more since the birth of new china, ten of the eleven major insect pests and plant diseases listed in the early post-liberation years as highly detrimental to crops -- locust, wheat midge, wheat smut, wheat nematode, cotton pink boll-worm, rice borer, army-worm, cotton aphis, red spider and sweet potato black rot -- have been largely stamped out or brought under control over extensive areas. damage wrought by the maize borer, the eleventh on the list, has also been considerably reduced.

control of locust pests is one of china's major achievements in plant protection. locust pests caused widespread and frequent devastation in the long history of china's agriculture. more than 700 locust outbreaks were recorded during the 2,600 years from 700 b.c. to 1935 a.d.. during such outbreaks locust swarms darkened the sky and blotted out the sun. stretches of crops were eaten off in areas that spread over several million hectares and countless peasants fled their home villages in helpless panic. soon after liberation, in 1951, aerial spraying of insecticide for locust control was carried out for the first time in china with the help of the air force of the people's liberation army. in

addition, in the stricken areas, peasants, cadres and students turned out in their millions to spray insecticide or kill the insects by hand labour. thanks to inter-provincial coordination, most of the locusts were exterminated in the egg and nymph stages in the traditional locust-plague areas of hopei, shantung, honan and northern kiangsu and anhwei provinces. thanks to these operations, locusts have not inflicted damage to crops over large areas in china since liberation.

chinese scientists have investigated locust breeding grounds in all parts of the country and derived the laws that govern locust outbreaks. besides using insecticides, major locust areas have laid emphasis on measures to rid the countryside of locust breeding grounds. these areas have tackled the problem of floods, droughts and locust pests simultaneously. they have built water control projects, grown paddy rice on dry cropping land and planted forests. the breeding grounds for locusts, riverside and low-lying marshy wasteland, have been turned into productive farmland. this has been a major factor in bringing locust pest under control.

chinese plant protection scientists and seed breeders have cooperated to investigate and study the incidence of wheat rust. they have selected and bred varieties of wheat resistant to rust and popularized them over large areas throughout the country. this, plus the use of pesticides and the adoption of farming measures, has helped effectively control stripe rust and stem rust in the country's major wheat-growing areas for the last ten years and more. scientific workers joined the poor and lower-middle peasants in the rural areas in studying sweet potato black rot together. they have worked out effective measures to prevent and control the blight.

rice is the major staple food crop in china. in the past, rice-borers used to destroy over ten per cent of china's annual rice harvest. at worst, peasants got nothing from the plagued fields. in a great number of the major rice-producing areas in southern china, damage caused by rice-borers has now been reduced to less than one per cent, and in some places, damage is down to a fractional one thousandth.

the army-worm was a common plague to various cereal crops. army-worm moths have the habit of flying in swarms over long distances and were dreaded as "divine insects" in the old society because their erratic migrations made their advent difficult detect and forecast. they often appeared suddenly in one place and then disappeared abruptly after having ravaged the crops.

work to prevent and control the army-worm pest started shortly after liberation when scientific institutes and production departments in more than twenty provinces and municipalities were organized by the communist party and

the people's government to pool their efforts in scientific research.

in one of the research projects, hundreds of thousands of moths were dyed a distinctive colour and released in shantung province. at the same time several hundred recovering posts were set up to trace their flight. the observations made showed that army-worm moths fly from south to north in the spring and move back to their wintering grounds in the south after july.

under the guidance of the central agricultural science department, the provinces and municipalities joined forces in a battle against the insect. having mastered the technique of forecasting the insect's emergence, they have been able to take timely action to bring the pest under effective control. the control measures adopted include killing the moths with poisonous bait or luring them to lay eggs at given places so these can be destroyed, and, where needed, spraying insecticides.

new china attaches great importance to plant protection. agro-scientific research institutes exist at all levels of the central, provincial, prefectural and county authorities. in the major farming areas, the overwhelming majority of the counties and rural people's communes have set up stations for observing and forecasting insect pests and tracing plant diseases. most of the production brigades have such establishments and in general production teams have their own plant protectionists. this plant protection network made up of several million people from the county, commune, brigade down to the production team level is part of the agro-scientific research network which now covers china's countryside.

how does this plant protection network work? huahsien county in south china's kwangtung province is a case in point.

the county, which is dozens of kilometres from kwangchow city, is a high-yield rice-growing area. in addition to the county station for observing and forecasting insect pests and tracing plant diseases, the six local people's communes and three state farms all have their own stations. some 85 percent of the production brigades have set up observation and forecasting centres and nine out of ten production teams have their own plant protectionists. the whole county now boasts 1,870 plant protectionists.

chao yueh-chin, deputy director of the agricultural scientific research institute of huahsien county, said: "our institute and the local insect pest and plant disease forecasting stations have kept records of the life-cycle of rice borers and the extent of damage they do in the county every year since 1957. these records are of immense value. the county station reports timely information about the emergence and spread of rice borers every year.

the pest emerges at different times according to the varying natural and weather conditions in different districts of the county. so all communes and production brigades issue forecasts according to their own observations and records. in this way we are able to know the situation more accurately and eliminate the pests more effectively and economically.

neither in huahsien county nor in other parts of the country do the stations and posts in the rural plant protection network operate in an isolated way. when insect pests are at their most destructive stage, each brigade reports the situation daily to the commune to which it belongs and each commune relays these reports every day to the county agricultural department. when necessary, the counties report regularly to the prefecture or province. based on accurate observations from each station and on the general situation over a large area, plans are worked out to deploy manpower and equipment to battle the harmful insects. in ordinary times the stations exchange experience and information on a routine basis. this massive plant protection network could neither be established nor work efficiently without the collective economy of the people's communes as its mainstay or the close cooperation, mobilization and planning made possible by the socialist system.

china is experimenting on and popularizing methods to use insects and bacteria to reduce damage from harmful insects, and use bacteria and anti-biotics to control plant diseases. scientists are going to rural areas to apply their research results in production and help train peasant plant protectionists. many areas are using trichogramma (a kind of parasitic wasp) to eliminate rice borer and rice-plant skipper, corn borers and sugar cane borers, and using chalcid wasps to get rid of cotton pink bollworms. some areas have used kasugamycin and other anti-biotics as well as beauverig bassiana (a kind of fungus) to eliminate rice diseases and used micro-organism as weed-killer with fairly good results.

China Changes Its Field Management Methods
-- Eight of a Series on China's
Agricultural "Eight-Point Charter"

(NCNA-English Peking, Nov. 13, 1975)

throughout china, efficient, scientific methods of field management based on large-scale collective farming have steadily replaced the conservative and backward methods that typify small-scale individual farming.

special groups responsible for day-to-day management of the fields have been set up in the production teams under the people's communes. these groups pay attention to the specific requirements of the crops at different stages of their growth and help the production teams concentrate their manpower and material on field management when crucial growing periods set in. this rational planning and scientific approach serve to ensure ample yields.

on the plains in china's main agricultural zones, the numerous small, uneven and irregular farm plots -- vestiges of the small peasant economy -- have by and large been merged into large, regularly-shaped fields. in mountain areas, too, plots on hill slopes are being trahsformed into large terraced fields. millions of hectares of farmland are now served by pumping stations while the acreage ploughed by machine is constantly being expanded. but the change-over from small to large-scale farming means more than changing the size of the fields and the pattern of farming. it lays down the conditions for the now liberated chinese peasants to give full scope to their collective strength and wisdom.

facts show that meticulous management can affect the growth of the crops to a considerable degree. peasants in many areas classify crop plants into three grades according to their growth characteristics. the grade b and c plants are brought along by extra applications of fertilizer, by irrigation or drainage and by loosening the soil. in this way grade b and c plants develop as well as those of grade a.

when there is bad weather, the people's communes and production brigades and teams muster manpower and material to deal with it. through mutual help and cooperation, they are able to strengthen management of the affected fields and avert or substantially reduce losses.

the change in field management techniques is going on both in former low-yield areas and in traditional high-yield areas. the minority people in remote areas, who before liberation farmed by the slash and burn system without weeding or applying fertilizer, now use new farming methods and their advance has been described as "a leap over the centuries".

in the traditional high-yield areas in many parts of china, field management is done in such a meticulous way that it has become a highly skilled art. here traditional farming methods have been combined with new methods evolved by the peasants over recent years.

for example, to ensure a good harvest, peasants can stimulate or retard the growth of wheat, rice, cotton and other crops at different growing periods by adjusting the amounts of water and fertilizer applied.

when winter wheat is in the tillering stage, commune members apply nitrogenous fertilizer to hasten the growth and then in spring, after there are an adequate number of tillers, they stop fertilizing and watering to prevent overgrowth. later, during the jointing and earing stages, they again nurse the plant with fertilizer and water so that it will put out good full ears.

to prevent the wheat stalks from growing too tall, chinese peasants also use stone-rollers to press down the sprouts. another method used to control growth is to hoe around the plant to break off parts of the root.

all these methods of controlling crop growth were developed after liberation.

by sowing an adequate amount of wheat seed on a given plot and then alternately stimulating and retarding the crop's growth, peasants in some high-yield wheat areas are now able to obtain an anticipated number of seedlings and tillers and then, at the maturing stage, an anticipated number of ears.

by using such scientific methods to control wheat growth, the sungchuang production brigade of the chiliying people's commune in central china's honan province has for years obtained a wheat yield of 7.5 tons per hectare as against about one ton before liberation.

party secretary hsueh chen-hsiang of the high-yield wheat producing shihtsun production brigade in east china's shantung province commented: "the peasants are now able to water and apply fertilizer rationally according to the weather, the soil condition and the growth stage of the crop. before liberation, although i wanted to farm, i had no land and i was always hungry. that gives you an idea why we, the liberated poor and lower-middle peasants, are determined to do a good job in farming today."

he went on to say: "now, our production brigade keeps a record of the amount of seed, fertilizer and water used on each and every wheat plot. this shows the degree to which our commune members have mastered the science of managing wheatfields."

the commune members have never slackened their efforts in improving field management. many areas in southern china now grow three crops a year. the people's communes and production brigades there rationalize manpower arrangement and plan their farm work way ahead. they set themselves this target: "in slack seasons make plans for the coming busy seasons. always plan a season ahead and a year before. increase production of all crops in every season, in the whole year and for the years to follow."

the yangtze river delta, a grain producing region, has a tradition of intensive and meticulous farming. but before liberation a harvest of three tons of grain per hectare would be considered a good year. now some 600,000 hectares of grain fields in soochow prefecture and on shanghai's outskirts average 10 to 10.8 tons per hectare, three to four times the output in the pre-liberation days.

the lungchiao production brigade of soochow prefecture had a good grain harvest on 80 hectares last year, averaging nearly 18 tons per hectare. some commune members declared: "maybe we've reached the summit." but most of the commune members answered: "no, we're far from reaching the summit. it's only the beginning of our climbing the mountain."

China Develops Farm Mechanization by Self-Reliance -- Ninth and Last of a Series on China's Agricultural "Eight-Point Charter"

(NCNA-English Peking, Nov. 13, 1975)

china, as a developing country, is realizing her farm mechanization step by step by relying on her own industry and broad masses.

early in 1955, in his writing "on the question of agricultural co-operation", chairman mao comprehensively explained china's basic line in developing agriculture. he pointed out: "in agriculture, with conditions as they are in our country co-operation must precede the use of big machinery (in capitalist countries agriculture develops in a capitalist way)." after the setting up of the rural people's communes, chairman mao promptly pointed out: "the fundamental way out for agriculture lies in mechanization."

following chairman mao's teachings, the chinese peasants, soon after the land reform which abolished the feudal system of land ownership, set up in close succession mutual-aid teams, elementary agricultural producers' co-operatives and advanced agricultural producers' co-operatives. in 1958, they established the people's communes in almost every corner of the rural areas.

china has made great efforts to improve the existing farm tools and implements and produce various semi-mechanized equipment while increasing the use of modern farm machines in a planned way. the pace of farm mechanization has been accelerated in recent years, especially since the great proletarian cultural revolution started in 1966, as china's industry is providing the country's agriculture with more machinery.

today on the vast plains of northern china, tractors are widely used for ploughing and sowing and the acreage served by power-driven pumps for irrigation and drainage has multiplied. in southern china irrigation and drainage have already been mechanized and tractor-drawn ploughs have been used on a large-scale. electric ploughs and power-driven ploughing boats specially designed for paddy fields are in use in some areas. a growing number of counties, communes and production brigades are equipped with rice transplanting machines. lumbering, stockbreeding and coastal fishing areas have adopted modern equipment.

on the tibetan plateau, tractors are being introduced in addition to large numbers of improved iron farm tools. before, under the rule of centuries-old serfdom, there were only wooden ploughs, harrows and other primitive tools.

china's tractor-ploughed acreage in 1974 was double that in 1965, the year before the great proletarian cultural revolution began. in that period the power capacity of irrigation and drainage machinery increased nearly four times. nearly one-third of china's cropland now give high and stable yields despite drought and waterlogging. all this is an important factor behind china's successive good harvests.

the achievements made since liberation has testified to the correctness of the basic line for developing china's agriculture laid down by chairman mao. if china had not achieved agricultural cooperation in time after the land reform, her scattered and backward small peasant economy would not have been able either to cope with natural disasters and other difficulties or achieve stable expansion of production. it is beyond the power of a small peasant economy to produce the increasing amounts of grain and other farm produce

required by socialist industrial construction. the transformation of small peasant economy into socialist collective economy has made possible the steady development of agricultural production by relying on the peasants' joint efforts. this has in turn laid down favourable conditions for farm mechanization and for building up a large-scale, modern socialist agriculture in china.

the recent national conference on learning from the pace-setting tachai production brigade called on the whole party and the people of the whole country to go all out to expand agriculture, build up tachai-type counties throughout the country and realize the magnificent goal of achieving farm mechanization in the main by 1980.

in such a big country as china, with several hundred million peasants, it is a great revolution to switch step by step from employment of hand tools that have been used for centuries to large-scale use of modern farm machinery. farm mechanization will raise labour productivity, giving the peasants more time to develop a diversified economy and adopt scientific farming to accelerate the building of a new, prosperous and rich socialist countryside. it will help bring into full play the people's communes' advantage of being "big in size and with a high degree of public ownership", and step by step narrow the gap between town and country, worker and peasant and mental and manual labour. all this is of great significance in building china into a powerful, modern socialist country.

in the manufacture of farming machinery, china's policy is simultaneous development of industries run by the central and local government, giving priority to local industries; while big, medium and small agricultural machines are being manufactured, the stress is on medium and small ones. the state gives some assistance to communes and their sub-divisions purchasing these machines but in the main they draw on their own collective accumulation funds. the spirit of this policy is that the mechanization of farming depends mainly on the people's own efforts.

the manufacture of big farm machines is planned by the related state departments; farm machinery of smaller sizes is produced mainly by local industries run by the provinces, prefectures and counties. the small farm machinery plants of the rural people's communes and production brigades also joined in designing and production.

the provinces, municipalities and autonomous regions set up small iron and steel, cement, machinery plants as well as coal pits to provide the raw materials for producing more farm machines. more than twenty provinces,

municipalities and autonomous regions in china now have tractor and hand tractor plants and plants for making motors and engines; 96 percent of all counties have farm machinery repair plants. most people's communes and production brigades have their own farm machinery repair centres or workshops.

farm machines in china are produced in an organized way with cooperation between the different industries. that is, under the unified leadership of local party committees, a division of labour is worked out among factories which make different parts of the farm machines and finally assemble them. in this way the potential of the existing factories is fully utilized and mass production is made possible without needing to set up more new factories. as a result investment needs are small yet the work is done quickly to high standards and costs kept low. take the example of the kwangsi chuang autonomous region where industrialization is on the weak side. in 1973, 77 plants in the region joined their efforts in producing the "harvest model 37" tractor. output of the tractor this year was four times the 1970 figure without adding new factories or increasing the labour force.

china's topography is greatly varied and farming conditions differ considerably from region to region. there are hilly areas, rolling plains and areas dotted by lakes or criss-crossed by rivers and canals. this calls for farming machines of different types and sizes, especially the medium and small ones. the local plants are well placed to meet the local needs.

now china can produce more than 1,500 different kinds of farm machines and implements, quite a number of which can be put to multi-use. china can not only produce big tractors but also small tractors and hand tractors that are suitable for hilly land and horticulture. there are also wheel-type and caterpiller tractors for paddy fields and dry cropping land. in order to meet the need of good field management, the farm machinery plants also make equipment and tools for ridge culture, close planting and inter-cropping.

since the level of machanization in china today is not yet high, great attention is being paid to develop semi-mechanized and improved farm implements. for example, while great efforts are being made to produce more tractors, the improvement of animal-drawn ploughs also receives attention. though more motor vehicles are now being used in the countryside, the number of rubber-tyred animal-drawn carts and pushcarts is also increasing.

the rural people's communes use their labour force rationally to ensure that while grain production is given priority, they also engage in diverse economic undertakings

to accumulate more funds for buying farm machines. the state gives financial aid to those people's communes and production brigades that are in difficulty while at the same time helping them to expand production. with the expansion of china's industry, prices of farm machines have been lowered several times in the last few years.

as mechanization of farming advances, the party organizations at various levels give great attention to the training of technicians for the people's communes, production brigades and teams. special training classes have been set up to help raise both their political and technical level. china now has well over 10 million tractor drivers, irrigation and drainage station operators, mechanics, maintenance workers and electricians. a generation of socialist-minod peasants who are technically competent is growing up.

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